UNIVERSITY OF WASHINGTON

ARBORETUM BULLETIN

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WINTER, 1972

PRESIDENT'S MESSAGE

The concern that has been occupying all our minds this fall and winter has been the financial crisis that has beset the Arboretum. This has been partially and temporarily relieved by the re-hiring of some of the maintenance staff through federal funds. This does not answer the problem for the future. As Foundation members, we must continue to do the best we can to educate our legislators and community to the continuing needs of the Arboretum. To assist you in that endeavor the attractive brochure describing the function and purpose of the Arboretum, published by the Foundation, is now available.

However, other things have been happening. In late October the Arboretum staff and Foundation were the hosts to a very interesting group of people. The International Dendrology Society came through on a tour, visited the Arboretum and made a trip to Mount Rainier.

The model of the memorial gates designed by Mr. George Tsutakawa will be ready for presentation to the Board of Directors in the very near future. They hold every promise of being a handsome addition to the Arboretum and a fitting tribute to the memory of those in whose names the contributions were made.

The Arboretum Foundation under the leadership of Mrs. H.P. Clausing with Brian Mulligan and a committee of representatives from interested groups are developing plans for a symposium to be led by knowledgeable and outstanding arboretum personalities throughout the country. They would be joined by our University representatives, city, county and state officials and interested organizations and private parties to explore the various roles and problems of an arboretum in a contemporary urban community. This will be held sometime in June. We hope that the results of this symposium will give further direction to all interested parties on the future of the Arboretum.

We are saddened to note the deaths of three Foundation members: Mrs. John Schwager, Mrs. Lawrence Bogle, and Mr. Harrison Overturf. We will miss them and extend our sympathies to their families and friends.

THE ARBORETUM BULLETIN

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Seattle, Wn. Winter, 1971

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THE UNIVERSITY OF WASHINGTON
Arboretum bulletin

VOLUME XXXIV, NUMBER 4

Winter, 1972

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COVER PHOTO: Cones of Sitka Spruce,
(Picea sitchensis)
Photo by: B. O. Mulligan

Looking northeast from the top of a dune.
Photo by: John R. Steveley

THE SAND DUNES - JUNIPER FOREST
An Isolated Stand of Western Juniper

*ED SCHREINER**

One of the largest remaining natural stands of western juniper *(Juniperus occidentalis)* in the state of Washington is located in Franklin County, about fifteen air miles northeast of Pasco. It is located in an area known as the Sand Dunes – Juniper Forest, or Ryegrass Coulee. The stand is restricted to an area of active, moving sand dunes surrounded by a sagebrush *(Artemesia tridentata)* dominated community. The area is extremely interesting, as this stand represents the approximate northern-most limit of the species and is apparently in a tension zone[1].

The juniper area is characterized by large, active sand dunes, small ravines, low ridges, gentle sloping valleys, and a fairly large number of hummocks interspersed with older blowouts. Elevation of the area containing the major juniper concentrations ranges from about 800 feet to 1100 feet above sea level. Average annual precipitation is between five and ten inches (U.S. Weather Bureau, Kennewick, Kahlotus and Ice Harbor Dam Stations). Temperatures may exceed 100 degrees in summer and fall below zero in winter. Winds tend from the southwest, and soil material ranges from sandy to sandy loam in texture (personal observations).

The only known tree species of the area is western juniper. Subordinate plant species include: sagebrush, antelope bush *(Purshia tridentata)*, bunchgrass *(Agropyron* spp.), cheatgrass *(Bromus tectorum),* ryegrass (probably *Elymus* spp.), hop sage *(Grayia spinosa),* grey rabbitbrush *(Chrysothamnus nauseaosus,* and green rabbitbrush *(Chrysothamnus viscidiflorus).*

Some results of a brief preliminary study conducted in November, 1970, by the author, show, within limits of the study, that com-

*Graduate Student, Plant Ecology, College of Forest Resources, University of Washington.

[1] A tension zone is an area where vegetation is growing under borderline conditions of survival. In other words, it might be considered an area where a given community is growing, but if conditions were much harsher the community would not exist at all in that particular area.

munity characteristics of this stand vary quite dramatically with changes in micro-climate over a small area. Four one-twentieth acre plots were studied as to number, age, and size of the juniper, species composition, and percent cover of subordinate species. Sample plots were set in areas where differences in community characteristics were readily apparent. One plot, about eighty yards northeast of the face of a large sand dune, included four western junipers eight to twenty-one feet tall; sagebrush, three to six feet tall, covered about fifteen percent of the plot, and cheatgrass covered about seventy-five percent of the plot. A second plot, on the northside of a small ridge about three hundred yards northeast of the first, included three junipers four to ten feet tall; sagebrush covered less than five percent of the plot, and cheatgrass mixed with bunchgrass covered ninety percent of the plot. A third plot, about one hundred yards northeast and down the ridge from the second, included eleven junipers three to eighteen feet tall, no sagebrush, and cheatgrass mixed with bunchgrass covered ninety percent of the plot. Trees ranged in age from twenty-two to ninety-eight years. It is interesting to note that four trees less than ten feet tall were over ninety-three years old.

The above sample plots seem to indicate that this particular juniper community is growing under marginal conditions. This is apparent from the observation that small changes in micro-climatic factors, as influenced primarily by topography, brought about changes in the community structure. In other words, slightly more protected sites had larger juniper and a different understory structure than other less protected areas. Further, these differences occurred very close to one another. By closely examining the photographs, the reader will see

Aerial photograph showing the Sand Dunes—Juniper Forest area. The major occurrence of junipers is in the upper third of the photo. Notice the sand dunes surrounding the area.
Photo by: E.G. Schreiner

vegetation patterns illustrating this point. Note, for example, the groups of sagebrush occurring in pockets and the lack of sagebrush on low ridges.

Perhaps the most interesting aspect of this plant community is its isolated occurrence. Seemingly for no reason, in an area usually dominated by sagebrush, we find a small stand of juniper covering a total area of less than 600 acres with scattered clumps and individuals covering about 2,000 acres.

Sudworth 1908 and Lyons 1967 report the occurrence of this stand as well as three others in Washington State. St. John 1963, locates western juniper on ridges in the Blue Mountains, and in valleys of the Grand Ronde and Snake Rivers in Asotin and Whitman Counties respectively. Hitchcock *et al.* 1969, Fowells 1965, and Sargent 1922 describe the range of western juniper in Washington as being scattered along the Columbia River and other areas east of the Cascade Mountains. Franklin and Dyrness 1969 describe the western juniper zone as reaching a maximum development in central Oregon. Little 1971, supports the view of Franklin and Dyrness and also shows the trees occurring near Pasco, in southcentral Washington along the Columbia River near John Day Dam, as well as in Kittitas County near Ellensburg, in the southern part of Whitman County on the Snake River, near Wenatchee in Chelan County and in the Grande Ronde River Basin.

It appears, then, that the nearest seed source to the Sand Dunes – Juniper Forest near Pasco at the present time is at least sixty miles to the southwest. Fowells 1965, indicates that a probable means of seed dispersal is by birds. It is conceivable that birds were responsible for the initial seed transportation.

At present, the most likely explanation for the occurrence of the juniper near Pasco is the sandy textured soil. However, there are at least two theories as to why the juniper, rather than the sagebrush, dominates on the sandy soil. One theory is that the sandy soils actually hold more available water for plants than the finer textured soils *in a very dry climate.* The pores in a finer textured soil are smaller and more numerous than in coarse textured soil; therefore, when the soils are almost completely dried out, the suction holding moisture in the finer textured soils is stronger and less moisture is available for plants. A very small amount of precipitation, then, on a sandy soil may provide water to plants that would not be available to them on finer textured soils under similar conditions. This situation is analagous to that found by Emerson 1932, and Woodbury 1947.

The second theory concerns study of ponderosa pine *(Pinus ponderosa).* Franklin and Dyrness 1969, cite several references indicating

Looking north. This view is typical of the stand. Note size, sporadic occurrence of the trees, and figures in the photograph.
Photo by: John R. Steveley

that ponderosa pine does best on coarse textured soils since root penetration is not restricted. Thus the trees are able to extract more water since their root systems cover a larger soil mass. It is entirely possible that juniper trees are able to accomplish the same thing in the area near Pasco.

In any case, the critical factor in this area is water available to plants. Fowells, 1965, says that western juniper will occupy sites so dry that few if any other trees could survive. Franklin and Dyrness indicate that western juniper zone, relative to moisture, is between the ponderosa pine and shrub-steppe types. It is apparent then that the juniper near Pasco, for some reason, are getting enough water to allow them to successfully compete with sagebrush in an area that is normally inhospitable to any trees. It should be remembered, however, that soil alone may not be the reason the juniper are obtaining added water. It could also be due to moisture interception, since the elevation of the area is somewhat higher than the immediate surrounding terrain, or some other unknown factors.

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VEHICLES BARRED FROM AREA

PASCO — (AP) — A 2,500-acre area in the Juniper Forest northeast of here has been made off limits to all vehicles, Paul A. Arrasmith, Bureau of Land Management district manager, said Wednesday.

Arrasmith said the move was made to "protect the vegetative and scenic resources within the area." . . . [which] encloses "a unique stand of Western juniper trees and towering sand dunes".

—*Seattle Post-Intelligencer, February 18, 1972*

Lewisia rediviva
Photo by: Joy Spurr

Growing Lewisias

*FLORENCE FREE**

Lewisias are a group containing some of the finest wild flowers of the Pacific Northwest. Most people think they are impossible to grow in a garden, yet in England they are successfully grown and highly prized. Why is this?

I think one reason may be that the commonest one, the one we are most likely to try, is, indeed, very hard to grow. This one, *Lewisia rediviva*, the well-known "Bitterroot", grows on scabland over a wide area from the Cascades to the Rockies and from Canada to California. The specific name, "rediviva", which means "return to life" holds the clue to its intractability. "Return to life" implies that although it appears to be dead it will revive. It appears to be dead in summer when it is hard to find any trace of it in ground where we know it is plentiful, having seen it bloom profusely the preceding spring in company with Phlox, *Eriogonum thymoides,* Gairdner's Penstemon, Erigeron, etc.

The secret of growing it is to give it this summer "dead" period, to let it dry up as completely as it does on the scablands. Very few gardens can provide this degree of dryness. In my garden it means that I must keep it potted so that I can move it in summer to a completely dry place. Then in the fall when the small tufts of cylindrical, succulent leaves appear, I move it back into the garden. Winter wet and freezing and thawing will not hurt it, but dampness in summer, causing it to lose dormancy, will weaken it until in two or three years it will fail to put up even its tiny leaves, to say nothing of its amazingly large, pink waterlily-like flowers. For me, it is really not worth the work involved, especially when I can enjoy acres of it a short distance away on the heights above Ellensburg. If one lives in a dryer area than Seattle and wishes to try propagating it from seed, there are articles in the Summer, 1971 *ARBORETUM BULLETIN* by Altha Miller and Charles Thurman telling how to collect and grow the seed.

Beautiful as *Lewisia rediviva* is, there are finer ones and fortunately they are easier to grow. *Two* of them are *Lewisia Tweedyi* and *L. cotyledon. L. Tweedyi* is endemic to the Wenatchee Mts. where it is rare enough to have had an area set aside primarily for it, to assure

*Mrs. A. K. Free, a knowledgeable member of the Rock Garden Society and Arboretum Foundation, has a charming small garden in Laurelhurst and is known for her excellent color photographs.

its survival. This is the Tumwater Canyon Botanical Area near Leavenworth. *L. Tweedyi* is such a beautiful plant with its very large apricot-colored flowers arching gracefully over its informal clump of well proportioned obovate leaves that to see it is to want it. This is testified to by places outside the Canyon where holes mark the spots where once it grew. It is tragedy compounded when one realizes that most of these collected plants had little chance for survival. Large plants do not reestablish easily and for years their cultural requirements were not understood.

Succeeding with Lewisias has not always been the rule, even for the English. Listen to Reginald Farrer in his great book, THE ENGLISH ROCK-GARDEN, published in London in 1919. "Lewisia Tweedyi is the most beautiful of all and may sometimes be seen happy in low and damp places". I would add, "Maybe seen sometimes, but not for long!" because it was crown rot that defeated so many early attempts to grow it and a low, damp place is the exact opposite of what it needs to make it happy.

To prevent crown rot it is essential to keep the crown of the plant as dry as possible. This is done by planting it on a slope with good drainage, and by replacing soil around the collar with two inches of grit or pea gravel so that air can reach it. I take the added precaution of giving it fresh grit once a year to be sure that moss and debris do not collect in it and keep it damp.

The other equally fine Lewisia, *L. cotyledon*, has the same cultural requirements. It is endemic to the Siskiyous of southern Oregon and the Trinity Alps of northern California. It is also rare, and is so desirable that it would be collected to extinction if the areas where it grows happened to be more accessible and everyone felt like taking as much as he wanted. Fortunately for gardeners, both of these Lewisias are now available from specialist nurserymen.*

Although *Lewisia Tweedyi* and *L. cotyledon* are both of an imposing beauty, their appeal is quite different. Whereas the beauty of *L. Tweedyi* might be described as refined or elegant, that of *L. cotyledon* could be described as stunning. The lovely flowers of *L. Tweedyi* are the largest, often more than three inches in diameter, and are made up of eight or nine petals of good substance with a boss of golden stamens in the center. They are always apricot-colored, although the apricot may tend sometimes more to pink, sometimes more to yellow. The smaller and more numerous flowers of *L. cotyledon* are held on stiffer stems so that they form a canopy over the plant and they vary widely in color. They may be red, or rose, pink, yellow, copper, or white.

The foliage of both is evergreen and it has the succulent quality that is characteristic of the family, Portulacaceae, but the foliage of the

**Lewisia cotyledon* will be for sale at the Spring Arboretum Foundation Plant Sale.

Lewisia cotyledon, white form, in garden at Juanita, Washington. Photo by: B. O. Mulligan

two is also quite different. The rather long, ascending, obovate or spatulate leaves of *L. Tweedyi* grow from a many branched crown and give an informal effect. In contrast, the leaves of *L. cotyledon* form a handsome, firm-textured rosette pressed as flat to the ground as a starfish. Its leaves, like its flowers, show great variation. Their edges may be smooth or crisped, flat or undulate, or they may be plain green or the green edged with red.

All of this variation on the part of *L. cotyledon* indicates that it hybridizes freely with other Lewisias such as *L. columbiana* and *L. leana,* (but not with *L. Tweedyi* which does not seem to hybridize). It is not surprising to find named varieties, e.g., *L. cotyledon Finchii, Howellii,* and *Heckneri.* It will self-sow its hybrids in a delightful manner and waiting to see what you have is one of the joys of growing it. So far, all the seedlings have all been welcome additions to my garden.

Your supply of any Lewisia can be increased vegetatively by taking cuttings. Reaching into the cluster of rosettes with a sharp knife and separating a few will not hurt the parent plant and the rosettes will soon root if they are pegged down in a gritty or sandy mix and shaded for awhile. I also make cuttings of a plant that I want to move, rather than trying to dig it, for an old plant with its coarse and far spreading root system is difficult to dig without injury and it will seldom survive a move. If an old plant falls victim to crown rot through the rosettes becoming too crowded, it can be rescued by cleaning away the rot and making cuttings of what is left.

Lewisias are hardy. They do not seem to be troubled by pests and they are not fussy about soil. Although *L. Tweedyi* prefers some shade, they can stand either sun or shade providing air circulation is good. If given conditions that prevent crown rot, they will be surprisingly easy to grow.

International Dendrology Society members at University of Washington Arboretum, October 15, 1971.
Photo by: B. O. Mulligan

Each In His Own Garden*

JULIA BELL THOMPSON

Rudolf Jacob Camerarius

Camerarius (1665-1721) was born in the old city of Tubingen, celebrated then and today for the manufacture of precision instruments and for its university, which still exists. He belonged to an old established family in the city, not far from Heidelberg and on the same River Neckar. His family sent him to the University of Tubingen where he was graduated in medicine. From the age of twenty-three he was a professor in the Medical School and was curator of the Botanical Garden.

Medical men are necessarily concerned with the human body and many therefore have a very real interest in the similarities and dissimilarities in the organs of other living creatures. Among the contemporaries of Camerarius were other doctors who shared the interest in the lower animals and in plants, some of them specializing in plants.

As for the advantage of using plants rather than animals, their cells and tissues are comparatively easy to deal with and their classification less difficult. Also there was (and still is) no such objection from the populace to the dissection of plants as to that of animals and men. At that time publication of research was often by exchange of letters between contemporaries.

A chart[1] will show you the names of a few with whom Camerarius may have exchanged letters and to whom he could have presented his findings on "Sex in Plants". They were four medical doctors: Malpighi in Italy, Nehemiah Grew in London, Rivinus of Hamburg, and Tournefort of Aix, France. They were all interested in the sex of plants and had become students not only of their leaves and roots but increasingly of flowers. Leeuwenhouk of Amsterdam, a maker of lenses, surely must have supplied his newly developed microscopes to some of these men. Leeuwenhouk was a member of the Royal Society of London and reported to them his findings on many aspects of animals as well as about the differences between such flowers as monocotyledons and dicotyledons. He might well have received the letter sent out by Camerarius.

The letter was detailed. He used both monoecious plants and dioecious; he tried several of many ways of cutting off the pollen from contact with the pistils; he stated that if the pollen reached the pistil and the uterus, the plant yielded fruit; if pollen was kept from them, there was no fruit. He stated conclusively

In the old University town of Tubingen on the Neckar. *Deutschland, Landschaft, Stadte, Dorfer und Menschen,* Busch, Harold, Editor, p. 45.

[1]See p. 24.

*This is a continuation of Mrs. W.F. Thompson's article on early botanists.

that the stamens were the male organs; the pistils, the female. This letter sent out in 1694 to his friends was probably applauded by them, but it was fourteen years after his death and forty-one years after the letters were published, before, by some fortunate chance, a Frenchman (could it have been some follower of Tournefort) published a review of the letter that fell into the hands of Linnaeus. The great Swedish botanist at the University of Upsala had become well known for reconstructing the botanical garden there into one of the finest in Europe. Linnaeus had become involved in an attempt to work out a natural system for classifying all animals and plants. Many systems were on record, none of them satisfactory. Many scientists brought forth their own systems and "confusion was everywhere confounded."

When Linnaeus came upon the letter of Camerarius "he was so excited by the news" that he made a close study of the problem. He immediately realized that in the neglected *stamens* and *pistils*, one had to do with a flower's most vital organs. From that view alone, their employment as a basis for systematic classification was justified. Thus arose the "sexual system." With some modifications that system is used to this day. Thus his experiment proving sex in plants has won for Camerarius an exalted place in the annals of biology.

Christian Conrad Sprengel

Sprengel like Camerarius was a German, but in that day of little travel they were far apart in space and time. While Camerarius was born in Southwest Germany Sprengel was born eighty-five years later in Northeast Germany in the town of Brandenburg in the province of that name, in what had become the Kingdom of Prussia under the rule of Frederick the Great. In the province were the cities of Berlin and Frankfurt and Potsdam, its historic capital.

There is no evidence that the great wars and shrewd intrigues of Frederick the Great, which greatly enlarged the boundaries and the influence of the kingdom, had any significant impact on the course of Sprengel's life.

So far as I know, Sprengel did not travel much except within a space of about fifty miles which he often traversed along the Havel River and its canals. They led him from Brandenburg through Potsdam to Berlin and Spandau.

In Berlin he was a tutor and schoolmaster. From there he went to Spandau as the rector of "Fredericianum" a "dignified" school nestled within the Spree Forest. Within that environment Sprengel found an absorbing interest in the adaptation to each other of plants and insects. Sprengel's education in theology and languages, though it had great influence on him, did not become the paramount interest in his adult life. Furthermore, though teaching was his career, it failed to capture his mind. What did seem to shape his life was that beautiful valley of rivers and forests, and its wild life. It is astonishing to consider the contrast between his quiet life and the wars of Frederick the Great.

Prussia and its center in Potsdam and Berlin were not far away from Sprengel and his school in Spandau. Prussian policy was making Prussia the largest state in Germany and exalting the King of Prussia to great power as the Emperor of Germany itself. Yet Sprengel seems untouched by Frederick the Great, who in turn was unaware of him.

Dr. B. J. D. Meeuse, a Professor of Botany in the University of Washington, has written a book on *Pollination* which gives us insight into Sprengel himself and his scientific discoveries:

To condense his statements, Meeuse says that only two or three centuries ago, people knew very little about pollination. He wonders at the dull world we would have if insects that carry sticky pollen should disappear from the earth. We would still have fruit from wind pollination of some plants that have dry pollen, but no sweet cherries, watermelons, cucumbers, no pumpkin pie and apple cider.

Meeuse praises early scientists who made progress toward clearer understanding of plants as living organisms. He ends his chapter by saying, "Altho Koelreuter was not blind to the role of insects, it is fair to say that Christian Conrad Sprengel was the first to see light here, therefore he will in a way be the hero of my story."

Meeuse did not say "To see the light" facetiously. "Sprengel was a deeply religious man who saw the hand of his Creator in the minutest

This Title Page of Christian Konrad Sprengel's book *Das Entdeckte der Natur im Bau und in der Befruchtung* (The Secrets of Nature Revealed in the Structure and Fertilization of Flowers) is unique in that it serves as a beautifully illustrated Table of Contents. The illustrations, each numbered, are Sprengel's own work; each number refers to a chapter in the book. Dr. B.J.D. Meeuse's book *Pollination,* Ronald Press, 1961, contains a discussion of Sprengel's book.

details he observed in flowers. His wonderful discoveries were a revelation to him, and the delightful book in which he describes his "flower adventures" is aglow with this spirit, humble and joyous at the same time."

Dr. Meeuse also details for us some of the adventures Sprengel tells of in his book. He tells how in 1787 at 37 years of age, Sprengel, in carefully examining the flowers of *Geranium sylvaticum*, realized "in a sudden flash of insight" that "the sweet sap" he saw there was "placed there by the Creator of the insects," and that the hairs were protection from the rain.

"The next year" to quote Dr. Meeuse again, "Sprengel examined the flowers of *Myosotis palustris*." Again he found a "sweet sap" and the "hairs for its protection," also the yellow "ring," that he believed was a guide for the insects to the deeply hidden nectar.

The next year he studied irises and found them so constructed that only bees and bumblebees can pollinate them, and fireweed that ripens its pollen and readies its pistil to receive pollen at different times. It thus forces cross pollination. And so the study went on from one flower to another.

Step by step, Sprengel learned of the many ways flowers and insects adapted themselves in this miraculous way — facts hard for us, even now, to believe except as we see the processes for ourselves. To Sprengel the subject was so engrossing that he neglected school and church. He wrote and illustrated a beautiful book with a long title, sometimes shortened to *Das neu entdeckte Geheimniss der Natur*, which one can

find in the University of Washington Science Library in its original German language and with Sprengel's illustrations.

These short quotations, showing the gradual awakening of Sprengel to the "whys and wherefores" of the flowers, seem to point to the fact that to Sprengel this was not a planned, practical, experiment to prove a point, but an unexpected flash of insight that so charged his mental faculties that hereafter his dedication was complete.

Sprengel's work shut out from his contemplation not only wars, victories, and great affairs of state, but more vital to him, the devastating fact that other men, among them his employers and his students, would not or could not share in his joy in these discoveries, and did not notice the publication of such a revealing book as his. Instead they charged him with missing church services, with neglecting his duties not only to the church but as Rector of his school.

He was dismissed from the school in 1794 with a pitifully small pension. That left him impoverished, toiling at poorly paid tutoring. In his last twenty-two years he gave private lessons, organized lectures and field trips, and died almost penniless.

Comparatively few men experience the joy of creative thought as did Sprengel and it seems hard to believe that such a man, who had walked in the forests and by the streams and had seen, and "divined" much of their meaning, could ever have been entirely unhappy. All of this and much more went into the beautiful book he had published in Berlin in 1793. Thirty-four years after his death and fifty-seven years after the book was published, Charles Darwin came upon it and was greatly strengthened in his belief in adaptation. He gave Sprengel such high praise as assured him the prominent place he holds in science today.

Nordenskiold, in his History of Biology says, "Space forbids a more detailed account of the numerous shrewd and far reaching observations which Sprengel adduces in support of his theories — he has laid a lasting foundation for one of the most important sections of vegetable biology — in regard to insect research, he has pointed out a method of far greater importance than mere classification and collecting. It was only Darwin's authority that succeeded in rescuing Sprengel from oblivion — thus Sprengel found redress — tardy but glorious."

(To be concluded)

"The forest problem is in many ways the most vital internal problem before the American people today."

President Theodore Roosevelt's First Message to Congress, December 3, 1901

Mrs. John Schwager
January, 1972

ELIZABETH MITCHELL

Writing about Dorothy Schwager is a joy because she knew how to live! Weaving in and out of the threads of her life was a love of nature that made up a strong part of the pattern of her being. She shared that love with her husband John, her children, with her sister Mary Pinkham, with other members of her family, and with countless friends.

Dorothy expressed her love of nature by being an active member of the Arboretum Amateurs, Unit 39. She expanded that interest by holding numerous jobs that were of a great help to the Arboretum itself. Dorothy worked with a quiet dignity, efficiently, and with a gentle wit that brought a "light touch" to the many jobs that passed through her hands. Propagating plants fascinated her, but she was rare in that her interest didn't stop there. Once she had grown plants, she was interested in seeing them become part of her own beautiful garden, or part of a larger program for the Arboretum.

She enjoyed much of the outdoors by sharing trips to the mountains with her husband, and with her children, who would tease her because she was forever stopping to identify plants and study their habits of growth. Many years ago she hurriedly drove to Mercer Island when she heard that a bulldozer was tearing up a section of land. She saved as many clumps of trilliums as she could and brought them to the safety of her own garden.

She used to go to the Skagit Flats to see the Snow Geese, to Lopez Island annually to cut a Christmas tree, and just this year enjoyed the ritual of going with her sister and husband to cut another tree for the holidays. After getting the most beautiful tree of all, they stopped near Deception Pass to gather greens on newly owned property. Her husband John had taken down a tree that they might have a better view. Dorothy admonished him for that. He explained that it was an ugly bent tree. She said, "Yes, but it was a tree!"

Through 1961 to 1968 Mrs. John Schwager was on the Board of Directors of The Arboretum Foundation, serving as Vice President in 1961 and 1962. She also held these other positions for the Arboretum Foundation Unit Council:

1951	Secretary of Unit 39 — Arboretum Amateurs
1952	Chairman of Unit 39
1956 & 1957	Assistant Membership Chairman Northeast District Representative
1958	Membership Chairman
1958 & 1959	1st Vice Chairman
1960	Volunteer Services Chairman
1961 & 1962	General Chairman
1963	3rd Vice Chairman and Advisory Chairman
1964	Advisory Chairman
1969	Work and Fun Day Chairman
1971	Herbarium Committee

Do not rob or mar a tree unless you really need what it has to give you. Let it stand and grow in virgin majesty, ungirdled and unscarred, while the trunk becomes a firm pillar of the forest temple and the branches spread abroad a refuge of bright green leaves for the birds of the air.

—Henry Van Dyke

The Proteas

*RUTH D. SVIHLA**

The term, Proteas, usually refers to the genera of the botanical family Proteaceae which are cultivated horticulturally as ornamentals. They are indigenous to the southern hemisphere particularly South Africa and Australia although some forms also occur in South America, New Zealand and even east Asia. The family Proteaceae include some fifty genera with over a thousand species of various forms. The genera which are grown in this country most extensively as ornamentals are *Protea, Leucospermum* and *Leucodendron* from South Africa and *Banksia* and *Telopea* from Australia. They are evergreen woody shrubs and small trees characterized by alternate, rigid, coriacious leaves. The flowers form large, cone-like heads with clustered bracteoles of various forms and colors which range from yellow and white through orange and sepias to different shades of red. Hence their popularity as ornamentals and cut flowers.

The name *Protea* is derived from that of the Greek god Proteus who was renown for the diversity of forms which he assumed. The name is particularly apt for this family of plants with its conspicuous variety of flowers.

For some years now the Proteas have been cultivated in this country particularly in southern California. At his Green Valley Nursery just north of Escondido, California, Mr. J. Howard Asper, Jr., has pioneered their cultivation from seed. He now has several acres of fully grown plants 3 to 10 feet tall, as well as seedlings in all stages of growth. He imports the seed and has been successful in growing them which in itself is a horticultural achievement. Like growing orchids from seed germination alone entails considerable care and patience.

In the wild, Proteas tend to produce few fertile seeds and together with their slow rate of growth and restricted soil conditions, they are sparsely distributed. In fact some species have become so rare in South Africa that the government has placed an embargo on the export of these seeds and plants.

Growing Proteas from seed is a challenging undertaking. Not only is the seed difficult to obtain now but when planted it takes anywhere from 3 to 6 weeks for germination. The soil should be a mixture of sand and well rotted compost slightly on the acid side with a layer of gravel or pebbles in the bottom of the flat or pot for good drainage. The seed which is somewhat large, about 3 to 6 mm. in diameter and tufted with dried stamens, should be set upright individually and pressed into the loose soil until the top is covered with about 3 mm. of soil. They need watering with a fine spray daily, preferably in the morning. It may be necessary to place a screen over them for protection against birds which are partial to them. They enjoy a good circulation of air and lots of sunshine. Hence their success in California where Mr. Asper grows seedlings under lath after sowing the seed in August.

Patience is required in waiting 3 to 6 weeks or longer before the first leaves appear. It is advisable to use a fungicide to prevent damping-off especially if the soil was not sterilized before planting. When the seedlings are about 10 cm. or more high they can be transplanted into separate pots or to their permanent place. Great care must be taken not to harm the tender roots which are somewhat fleshy and easily bruised. The seedlings may be grown on in pots of various sizes or when large

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*Dr. Ruth Svihla (Mrs. Arthur), botanist, plant collector and world traveller, now lives on Camano Island. She is a long time Foundation member.

enough set out in a sunny place with good circulation and well-drained soil. Since the shrubs grow to a good size, some up to 8 and 10 feet high, they must be set well apart. A shallow covering of shavings or bark around the base of the plant will help the soil to retain its moisture. Since the roots are usually shallow and tender they should be disturbed as little as possible by cultivation. Moderate watering is a necessity, for overwatering can be as fatal as underwatering. Mr. Asper waters in the morning and evening during the California summer and sets the potted plants under lath where they enjoy a constant breeze. He does not advise growing them in greenhouses or their use as house plants. Although the area around Escondido experiences occasional light frost which will nip the tender shoots and buds of the adult plants a real freeze can be fatal.

Can we grow these exotic plants here in the Northwest? They are well worth the care and trouble if we can find the correct conditions of loose, slightly acid soil, warm southern exposure and good circulation of air. There are certain places around Puget Sound where these conditions obtain and less hardy plants from the south can be grown successfully.

The Proteas are becoming more and more in demand by florists and nurserymen for their long-lasting flowers and ease of shipment. They are very popular as floral displays for shows, banquets, hotel lobbies and weddings. In South Africa their use is widespread. There hotels use huge displays in their lobbies as well as welcoming bouquets to greet the guest in his room. At the airports and seaports florists arrange bouquets in plastic containers for the traveller. The bouquets often last for several weeks. After the freshness is gone from the cut flowers they dry easily and keep indefinitely. When used fresh as bouquets their woody stems are cut every few days and the water changed. Most of the Banksias however do not need water and last better without it. After drying the flowers may be sprayed with a clear lacquer and used in making wreaths, floral displays and arrangements of exotic color and design.

For the gardener who enjoys experimenting with the unusual, growing these beautiful and interesting plants is truly a challenge.

Literature on the cultivation of Proteas in this country is practically non-existent. A book by Frank Roundtree on "The Proteaceae of South Africa" is published by Purnell of Cape Town, South Africa, but is difficult to obtain here. Nurserymen in Australia and New Zealand (particularly Duncan and Davies, a leading nursery in the latter country) handle Proteas and their relatives. Now in southern California more and more nurseries are growing and selling these plants as well as shipping the cut flowers all over the country. ▲

Overleaf:

Dr. Arthur Svihla, a retired Chairman of the University of Washington Biology Department, photographed the Proteas in the Green Valley Nursery in Escondido, California through the courtesy of J. Howard Asper, Jr.

The photos of *Chimonanthus praecox, Hamamelis mollis* and *Magnolia stellata* are the work of the late Dr. W. F. Thompson who devised special equipment for taking highly magnified pictures of flower parts. With his wife, Julie Bell, providing commentary, their efforts were popular and exciting program material for many garden groups.

The picture of *Garrya Fremontii* x *elliptica,* taken by J. A. Witt, is of a hybrid grown by the Arboretum from seeds obtained from the late Pat Ballard (Mrs. Page). A sister seedling named Garrya 'Pat Ballard' received an Award of Merit from the Royal Horticultural Society in London in 1971.

With exception of the Proteas, all are blooming now in the Arboretum.

D.E.B.

Banksia ericifolia

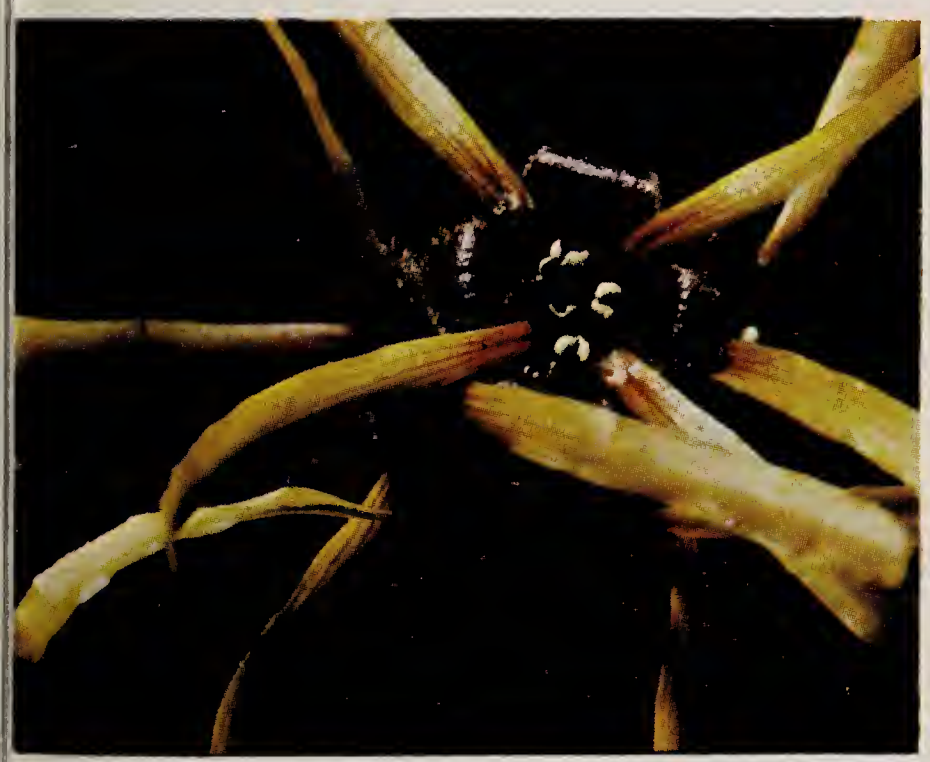
Banksia speciosa

Protea cynaroides

Leucospermum attenuatum

Chimonanthus praecox

Garrya Fremontii x elliptica



Hamamelis mollis

←

Magnolia stellata

ARBORETUM CLASSES
Spring, 1972

The College of Forest Resources administers the education program of the University of Washington Arboretum. For further information, call 543-2730. To register, send check (made payable to the University of Washington) to:

Arboretum Courses
Anderson Hall
University of Washington
Seattle, Washington 98105

SPRING TOURS Mr. Joseph Witt, Assistant Director of the Arboretum, will conduct tours of the Arboretum grounds in spring bloom, including Japanese cherries, rhododendrons and azaleas. Class limited to 25. Saturdays, April 8, 22, May 13, June 3; 10–12 noon. 4 sessions, $5.00.

BIRDS OF THE ARBORETUM Mrs. Zella Schultz, noted ornithologist, will conduct a field course in the Arboretum dealing with bird identification and adaptation. Class limited to 20. Students should have binoculars. Saturdays, April 15, 29, May 6, 20; 9–11 a.m. 4 sessions, $10.00.

NATURE PHOTOGRAPHY Mr. Donald Riecks, Director of University of Washington Audio-Visual Services, will lead this series, discussing the use of the camera to photograph plant materials under varying conditions of space, season and weather. Class limited to 20. Saturdays, April 15, 29, May 6, 20; 11–1 p.m. 4 sessions, $10.00.

EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT WEEDS Mr. Chico Narro, expert nurseryman, will teach this class, including weed identification, chemical and non-chemical methods of control, and the selection and care of equipment. 201 Winkenwerder, UW campus; class limited to 30. Tuesdays, May 9, 16, 23; 7–9 p.m. 3 sessions, $10.00.

SUMMER CUTTINGS Mr. Richard van Klaveren, Arboretum propagator, will teach seasonal techniques for propagating woody plants. Materials will be furnished. Arboretum greenhouse; each section limited to 10. 2 sessions, $10.00.

Section A: Saturdays, June 3, 17; 9:30 – 12:30 p.m.
Section B: Saturdays, June 10, 24; 9:30 – 12:30 p.m.

This is your Arboretum, kept alive by your support

We are pleased to welcome the following new members (October 1, 1971 through December 31, 1971): *Sustaining* – Mrs. Norman L. Cram. *Annual* – Mrs. Robert L. Alleger, Mrs. James H. Andersen, Miss Grace Anderson, Mrs. Robert Arundale, Mr. and Mrs. Robert L. Badger, Mr. and Mrs. James R. Bain, Mrs. Cecil Baxter Jr., Mrs. R.E. Benedict, Miss Susan Betke, Mrs. Robert N. Boehm, Mrs. Ed Boothby, Mrs. Frank H. Burlingame, Butchart Gardens, Ltd., Mrs. Ervin L. Crosby, Mrs. Robert B. Daniell, Florence K. Dirstine, Mrs. William Drummond, Mrs. L.A. English, Miss Florence Engstrom, Faculty Men's Club, Ernest B. Golosman, Mrs. Bill Graham, Mrs. R.J. Gregory, Mrs. James N. Grenfell, James W. Haviland, M.D., Mrs. Albert J. Hawks, Mrs. James Herrin, Mrs. Hugh H. Hotson, Mrs. B.C. Houghton, Mr. and Mrs. Ed Janhunen, Mrs. Jerold H. Klaimon, Mrs. Harry Levine, Mrs. Roland F. Line, Mrs. Charles F. Leonard, Mrs. D.H. MacKenzie, Mrs. George F. McDowell, Mrs. James W. McNamara, Mrs. John A. Moga, Mr. Joseph J. Morgan, Mrs. Robert A. Nathane, Mrs. Horace Nealey, Mrs. R.N. Payne, Mrs. Ralph F. Portmann, Virginia Priem, Mrs. James Randall, Mrs. W. Lloyd Raymond, Mrs. Lester Reynolds, Mrs. Howard Rothenbuhler, Mrs. Harold J. Runstad, Mrs. Glen D. Scheiber, Mrs. Verner Schomaker, Mrs. Jon M. Schorr, Mrs. James F. Senechel, Miss Jonnie V. Shands, Mrs. Lewis Shrum, Mrs. J.E. Sinclair, Mrs. Herbert S. Spencer, Mrs. Norman Standal, Mrs. Graham Tash, Mrs. George W. Taylor, Mrs. John S. Thompson, Dr. W.F. Thompson III, Mrs. George M. Toner, Mrs. Robert N. Turner, Mrs. Rudolph Vracko, Mrs. Irving L. Webster, Mrs. Elizabeth B. Willis, Mrs. Aubrey Wilton, Kate T. Yelle.

We are also grateful to the following members who have increased their dues to: *Sponsor* – Mrs. George H. Weyerhaeuser. *Contributing* – Thomas J. Etherington, Glen H. Hunt. *Sustaining* – Mrs. Michael Dyrnes, Mrs. Floyd Ellis, Miss Lesley M. Heathcote, Mrs. Dwight Henderson, Mrs. H.W. Kirschner, Mrs. W.C. Lindberg.

VEITCH MEMORIAL MEDAL

For his services to Horticulture, Brian O. Mulligan, Director of the University of Washington Arboretum, was awarded in absentia the Veitch Memorial Medal presented by the Royal Horticultural Society at their Annual General Meeting February 22, 1972. The honor is bestowed to those who have helped in the advancement and improvement of the science and practice of horticulture and for special exhibits. To the expressions of congratulation of the Royal Horticultural Society and Mr. Mulligan's friends in England and other parts of Europe and in the United States, The Arboretum Foundation adds its sincere congratulations for the high honor given to him.

D.E.B.

A.R.S. BRONZE MEDALS AWARDED

The Seattle Chapter of the American Rhododendron Society, on December 1, 1971, celebrated its twentieth anniversary with a banquet at the Edgewater Inn in Seattle, attended by approximately 120 members. The guest speaker of the evening was Mr. P.H. John Brydon of Salem, Oregon, who recently resigned as Director of the Strybing Arboretum in San Francisco. The main feature of the evening was the awarding of the highest honor presentable by a Chapter of the A. R. S., the Bronze Medal. Awards were made to six Seattle Chapter members for their work over the years providing the foundation and framework upon which the Society has been built. Awards were presented to Donald G. Graham, past President and a charter member of the Arboretum Foundation, to Brian Mulligan, Director of the Arboretum, Donald McClure, past Vice President of the Arboretum Foundation, Elizabeth Lansdowne and Arthur Luther, past Secretary and Treasurer respectively of the Seattle Chapter, and to Ed Hartnett, present Treasurer of the Seattle Chapter of the A.R.S. Without the diligence and effort of members like these, our horticultural societies would be hard put to function.

C. Edward Simons, Jr., M.D.

Donald Graham being congratulated by Dr. Edwin C. Brockenbrough, President of the Seattle Chapter, A.R.S.

Donald McClure receiving the Bronze Medal. L. to R.: Dr. Brockenbrough, John Putnam, Arboretum Foundation President, and Mr. McClure. →

Photos by: Dave Bledsoe

Unit Conversations

A number of Units earned high praise for their hard work in various sections of the Arboretum this Fall. Mrs. Frank Blake, Work and Fun Day Chairman, organized work parties for individual Units in response to the Arboretum's plea for maintenance help necessitated by recent legislative budget cuts. To further assist the Arboretum the Unit Council has decided to cancel the April 12 Work and Fun Day previously scheduled and to expand the project into three work forays to be conducted on a volunteer basis on March 29, April 22, and May 15. All Foundation members and citizens of the community are welcome to bring their own garden tools and a container at 9:30 A.M. each day and report to the Foundation Office for an assigned work area. Coffee and cookies will be served. Help us help the Arboretum!

At the January meeting the Unit Council Governing Board voted $600.00 to provide for five month's rental of a dump truck for the Arboretum. The Board also voted to allocate $1,530.00 to provide for the installation of new interpretive metal signs along the Arboretum's Waterfront Trail. Four years earlier $1,200.00 was donated by the Unit Council to make these signs. In addition to these funds and previously reported Unit Council gifts of $5,006.00, Brian O. Mulligan, Director of the Arboretum, has reported that various Units donated $4,731.00 to the Arboretum in 1971.

That Flower Thing in the Spring

*JEANNE GARDINER**

May 4 and 5 mark the twenty-fifth anniversary of the first Arboretum Foundation Plant Sale. How many thousand superior plants have been sold and how many hundred workers have participated in the years since that first sale in 1946? The parade of improved varieties marches past on this silver anniversary of that first sale. A preview of a few very special plants purchased for the 1972 sale will assure you that this year's "plant hunters" are tracking down rare and unusual items to carry on the tradition.

Gwen Bell (Mrs. F.H.) is excited over the improved and new rhododendrons for her department. Some are from Van Veen in Oregon. Others like R. 'Furnival's Daughter', a high trussed pink with crimson flare and a winner in the 1971 show; R. 'Ermine', a pure white sun-loving rhododendron; hard-to-find true yellows like R. 'Crest'; or the newly registered fluorescent pink, R. 'Lydia' from Greer Gardens will make the rhododendron fancier say "I must have that!" R. 'Wizard', an apricot creation of Halfdan Lem; a few plants of the spectacular white *calophytum* hybrid, R. 'Avalanche' a constant show winner; and R. 'Exbury Calstocker', a white with a maroon blotch on the upper petals, will be available.

Chairman Lee Clarke (Mrs. Fred), Trees Department, will have the four new northwest holly varieties described in December SUNSET. Ilex 'Elegance' and its male counterpart I. 'Accent' have small leaves and the berries ripen early. I. 'Oriole' has spiny leaves and brilliant berries. The fourth variety, I. 'Wirt L. Winn' seems to be a vigorous grower with large glossy leaves and shiny orange-red berries.

Mary Mullany (Mrs. George) chairman of the Ground Covers and Rockery Plants Department, has arranged to have native nursery grown garden plants such as Lewsias which are rare and hard to find in quantity. The lovely

evergreen pink *Lewisia cotyledon* planted in a well-drained scree garden would be a beautiful addition to a plant collection.

Have you been unsuccessful in your search for a special plant? Do you need a certain size tree or shrub to match one that died; are you looking for a plant which offers autumn color or winter flower or berry? Our 'plant hunters' are the answer to your problem. A pre-order will receive immediate attention by Mary Pinkham (Mrs. Roland) and her committee. A pre-order blank is provided below for your convenience. Order that special material and then save the dates May 4th and 5th for the spring plant sale in the Arboretum! ↑

*Hard working and dedicated Mrs. Arthur Gardiner is this year's Plant Sale Chairman.

The polished mahogany bark of *Prunus serrula* is beautiful throughout the year. Limited quantities of this tree will be available at the Plant Sale. →
Photo: Dr. Simons

ARBORETUM FOUNDATION PLANT SALE MAY 4 and 5, 1972

PRE-ORDER FORM

MAIL TO: Mrs. Roland Pinkham, 2229 Waverly Way E., Seattle, 98102

or call: Mrs. J. Orrin Vining AD 2-5320
or Mrs. Conner Gray AD 2-1602

QUANTITY	PLANT	SIZE OR PRICE RANGE

PRE-ORDERS *MUST* BE PICKED UP BETWEEN 4:00 p.m. and 8:00 p.m. on Thursday, May 4, unless prior arrangements have been made. Please send a *self-addressed, stamped* envelope with order. A confirmation of your order will be mailed to you. Pre-orders accepted only until April 18.

Name _____
Address _____
City _____ Zip _____
Phone _____

Book Reviews

THE PACIFIC BULB GARDENER. Gray's Publishing, Ltd., Sidney, B.C., Canada.
Owen, Rosemary, F.R.H.S. $3.95

Mrs. Owen's charming book reflects her love, observation, and study of the many bulbs available to the Pacific Northwest gardener, but she does not confuse us with too many specific names or too much advice. She has seasoned it with legends from mythology and history and, in most cases, states the origin of the species.

Besides ample notes on the classification and culture of crocus, tulips, narcissus, iris, and others, she guides the amateur grower to successful exhibiting, siting, and the avoidance or overcoming of diseases and pests. There is a chart for planting and flowering, a list of bulbs for various purposes, and an index. Sixteen black-and-white photographs by Mr. Owen are, for the most part, excellent.

Mrs. Owen is "down to earth", saying: "Plants are individuals, each with particular requirements, and all are rewarding to the gardener who takes the trouble to study specific growth habits." She is also a whimsical artist who makes a quick sketch of Daffodils caught in the car's headlights: "They stand in cordial welcome with open, smiling faces, bowing and dipping to the night breezes."

This is a book for any gardener to own for future reference. I would advise the reader to have a pencil and pad within easy reach. You will not be able to withstand the urge to place at least several of these bulbs on your "must have" list.

MARJORIE W. BAIRD

GARDENING WITH NEW ZEALAND PLANTS SHRUBS AND TREES. Collins Bros. & Co., Ltd. Auckland, New Zealand. $6.00 (N.Z.)
Fisher, Muriel; E. Satchel and Watkins, Janet M.

Mrs. Fisher, a retired teacher, has devoted forty years to the propagation, cultivation and study of the New Zealand native flora. This culminated in she and her husband, Mr. W. E. Fisher, being presented with the Loder Cup in recognition of their significant contributions in the cultivation and protection of their native flora.

She covers the cultivation and propagation of six hundred native plants, from tiny alpines to forest trees. These are all illustrated with a wealth of beautiful color photographs. The close up plant portraits are priceless for familiarizing plant enthusiasts with potentially desirable plant material, much of which is endemic to New Zealand.

Curious about your own back yard?

PACIFIC NORTHWEST JOURNAL OF NATURAL SCIENCE

To explore the intriguing spectrum of natural events here in the Northwest, join the thousands of subscribers to *Pacific Search.* This unique magazine will keep you abreast of the many pleasures — and problems — in our local surroundings.

Find out more about the killer whale dispute, hummingbirds, where Pacific salmon go, new devices for monitoring smog, fire ravaged forests, mushroom identification, and much more.

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Mail this coupon to: PACIFIC SEARCH, 200 Second Avenue North, Seattle 98109

☐ Here is my check for $4.00 for one year's subscription (10 issues) to *Pacific Search.*

☐ Please send me a complimentary copy of a current issue of the magazine.

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The book has been divided into five parts; covering ornamental trees and shrubs, climbing plants, hedges, rock gardens and alpines, and ferns. There is research into how the Maori regarded and used the plants. All the plants are arranged by families, with the latin, Maori and common name indicated for each individual. Mrs. Fisher suggests the best way to propagate and grow each plant. She also covers their tolerance to cold, extent and type of natural habitat.

Other chapters deal with the use of native plant material in New Zealand landscaping, illustrated by garden diagrams; and plants suitable for bonsai are even covered.

The authors have successfully cultivated each of the plants they have discussed. The outstanding plant portraits are mainly the work of Mrs. E. Satchell and Mrs. Muriel Fisher. The garden layouts and diagrams are the work of Mrs. Janet M. Watkins.

The research and first hand knowledge of the authors together with the outstanding illustrations make this book an interesting, and readable reference source of New Zealand plant material and it's use.

NEILL D. HALL

THE RHODODENDRON AND CAMELLIA YEAR BOOK, 1971, No. 25. The Royal Horticultural Society, Vincent Square, S.W. 1, London, England

Nineteen seventy-one marks the swan song of the three excellent annual year books published by the R.H.S. The annual publication of the year books was an invaluable contribution to the aggregate of knowledge in the horticultural world. These year books have been *The Rhododendron and Camellia Year Book, The Daffodil and Tulip Year Book* and *The Lily Year Book* and have been the work of specialty committees of the R.H.S. They have been discontinued for budgetary reasons, evidently having been rather heavily subsidized, especially so in the more recent issues.

The current Rhododendron and Camellia Year Book is on a par with the high standard set over the last several years and is especially comparable with hallmark year of the 1968 Year Book. The economy measure notable in the current Year Book is the absence of color plates except on the dust jacket. However, 66 black and white illustrations help to make up for that lack and the photographic quality is of a high order. The volume runs to 203 pages and covers 32 general subjects and a number of minor notes and articles.

The most important article from the taxonomic point of view is the new classification of the genus *Rhododendron* according to seed type, bud and floral arrangement, hair and gland types, leaf node arrangement and cotyledon arrangement. This emanates from the Botany Department of the University of Canterbury in Christchurch, New Zealand, and is written by Melva N. and W.R. Philipson and is a definitive article and is well-illustrated with a graphic fold-out chart. There are a number of excellent articles regarding dwarf Rhododendron species and hybrids and Rhododendrons for the small garden. The usual tour of a large estate garden, in this case, Westmorland, written by Mr. Michael Black is tantalizing. An article covering shade trees to associate with Rhododendrons by John Bond is notable. There is also a comprehensive article on the Taiwan Rhododendrons by J. J. Ravenscroft Patrick and Chien Chang Hsu. There are further notes on the Malesian Rhododendrons as grown in Australia by Mr. Headlam. A note by Mr. A. F. George of Hydon Nurseries outlines the propagation and continuation of the famous Tower Court Rhododendrons made famous by the late John Stevenson and Roza Harrison (nee Stevenson).*

Eight articles regarding the genus Camellia are interesting, both historically and, in addition, illustrate the current ascendancy of the Camellia hybridization and production using C. reticulata, C. japonica and C. saluenensis, which in the past ten years have resulted in the introduction of a whole new race of hybrids which have been little noted in the Pacific Northwest. They are becoming popular and available in California and throughout the South.

There is, at the end, the usual listing of awards to Rhododendrons after Trial at Wisley, as well as Rhododendrons and Camellias which have received other awards during the previous year and additions of new names to the International Rhododendron Register.

There is a similar broad scope and excellence to the other year books dating at least back to 1932 (as far as the Lily Year Book is concerned). Since the year books are chapter and verse for the keen gardener, it is regrettable that the R.H.S. has found it necessary to discontinue their publication and it is hoped that some suitable alternate arrangement can be made. As an illustration of the importance of these works, the book under review is now already out of print. It may be found in local libraries and a number of copies are in the hands of Rhododendron Society members and others.

C. EDWARD SIMONS, JR., M.D.

*The well-known Rhododendron AZOR is simply the first name of the late Mrs. Harrison spelled backward.

WILD FLOWERS OF THE UNITED STATES. Volume Five, Parts One and Two, *The Northwestern States* General Editor, William C. Steere, President, The New York Botanic Garden, with collaborators. Publication of the New York Botanic Garden, 1971. 666 pages, $57.50

Anyone contemplating the purchase of Volume Five entitled *The Northwestern States* should know the territory it covers. The title is misleading inasmuch as it includes only the part of Washington and the part of Oregon west of the Cascade Mountains and California south to latitude 34.30°N., about 30 miles north of Los Angeles, according to the map inside the cover. This belies its title and presents a disappointment to Washington and Oregon residents who do not confine their botanical interests to the west side of the Cascade Mountains. From the title one would expect the treatment to include all of Washington, all of Oregon and possibly Idaho. The argument for leaving the area east of the Cascade Mountains out of Volume Five is that the plant life there is so different from the rest of the area. However, this argument loses its value

when the flora of western Washington is compared with that of California immediately north of Lat. 35°N.

In this treatment one encounters a new arrangement of plant families which may not make much difference to the actual beginner but will require the use of the index for the botanist to find some of his favorites. Because of this new classification one finds the sub-families of three families (Leguminose, Ericaceae, and Campanulaceae) each widely separated from the family to which it is related. One encounters an abundance of introduced plants at the expense of a considerable number of worthy natives to be found within the area but not within this volume.

One is confused as to just where the eastern boundary in Washington and Oregon is to be drawn. Numbers of eastern Washington plants, including *Anemone patens* which occurs only on Mission Peak at the very eastern end of the Wenatchee Mountains, are included. This suggests that all of the eastern flank of the Cascade Mountains is included in the area. If this be so then many other worthy items are entitled to be included.

Perhaps because of the various sizes of the pictures, members of plants families are often interspersed with members of other plant families. An extreme case of disassociation is found in the case of two weeds of the teasel family, *Dipsacus*, pictured on page 529 and *Scabiosa*, pictured on page 631.

While there are many fine pictures of sufficient quality to identify certain plants, one could not identify most of the plants with any degree of accuracy from the pictures. Many of the illustrations in this volume are definitely of poor quality. The taxonomic treatment in some cases is far too conservative for the horticulturist, forcing him to look to other sources to serve his purpose.

As difficult as it is to identify plants from pictures, a number of mis-identifications are apparent. A few are as follow:

a. Page 95, Plate 29: Picture labeled *Eriogonum pyrolaefolium* is of *Spraguea multiceps* of the Portulacaceae, not Polygonaceae.

b. Page 241, Plate 78: Picture labeled *Boykinia elata* is probably of *Saxifraga mertensiana.*

c. Page 249, Plate 81: *Saxifraga occidentalis* (right center) is of *Saxifraga ferruginea.*

d. Page 281, Plate 89: *Montia siberica* is atypical or, perhaps, is *Montia parviflora.*

e. Page 285, Plate 90: *Montia parvifolia* is of *Montia flagellaris.*

f. Page 365, Plate 121: *Dodecatheon pulchellum* possibly is *Dodecatheon Cusickii.*

In summary, it seems evident that this volume was published prematurely. Further effort would have obtained much better illustrations, all too many of the photographs used being of unacceptable quality.

CARL S. ENGLISH, JR.

EACH IN HIS OWN GARDEN *(Continued)*

CONTEMPORARIES OF CAMERARIUS – 17TH CENTURY – STUDY OF PLANTS

Name	Date	Place	Notes	Published
DR. CAMERARIUS	1665-1721	Tubingen, Germany	Sex in Plants	Letters
DR. TOURNEFORT	1656-1708	Aix, France	Stressed flower and seeds	
DR. RIVINUS	1652-1723	Hamburg, Germany	Med. Dr. and Prof. Book *Ordo* Plantarum	Himself
DR. MALPIGHI	1628-1694	Bologna, Italy	Used microscope freely Plants and animals	Royal Society
DR. NEHEMIAH GREW	1628-1712	London, England	Did not study animals	Royal Society
LEEUWENHOUK	1632-1723	Delft, Netherlands	Made lenses – microscopes Monocots-Dicots	Royal Society

OTHER MEN OF INFLUENCE

Name	Date	Place	Notes
GUTENBURG	1398-1468	Mainz, Germany	Invented Printing Press
JUNG (Math)	1587-1657	Leipsig, Germany	Precursor of Linnaeus Tabulated Parts plants
DR. HARVEY	1578-1657	London, England	Circulation of blood – Hybrids
KOELREUTER	1733-1806	Karlsruhe, Germany	Foreshadowed Mendel
SPRENGEL	1750-1816	Berlin, Germany	Adaptation of species Berlin
LINNAEUS	1707-1778	Upsala, Sweden	System of Classification
DARWIN	1809-1882	London, England	Evolution – struggle

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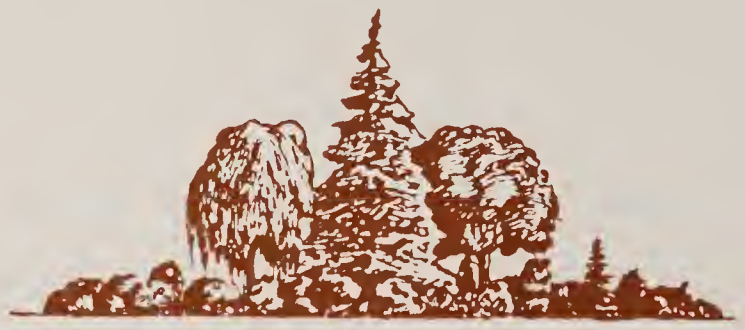

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